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IMPLEMENTATION PLAN REVIEW FOR PENNSYLVANIA AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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IMPLEMENTATION PLAN REVIEW FOR PENNSYLVANIA AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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IMPLEMENTATION PLAN REVIEW

FOR

PENNSYLVANIA

AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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February 1975

PENNSYLVANIA

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV required EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallels EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, four predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) the state's prerogative to surpass NAAQS; (2) the use of the example region approach in developing State-wide air quality control strategies; (3) the existence of state air quality standards which are more stringent than NAAQS; and (4) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations effect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted Air Quality Control Region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in controls which are more stringent than needed to attain NAAQS, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emissions and are a major source of TSP emissions.

Part of each States's review was organized to provide an analysis of the SO_2 and TSP emission tolerances within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the States's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, and E.

The State Implementation Plan for Pennsylvania has been reviewed for the most prevalent causes of over-restrictive fuel combustion emission limiting regulations. The major findings of the review are:

FOR BOTH PARTICULATES AND SULFUR DIOXIDE, THERE IS LITTLE INDICATION THAT EXISTING FUEL COMBUSTION EMISSION REGULATIONS ARE OVER-RESTRICTIVE.

The supportive findings of the SIP review are as follows:

Like many other areas of the nation, high levels of total suspended particulates are currently being found throughout the state of Pennsylvania. National ambient air quality standards for particulates were exceeded in each of the six Air Quality Control Regions during 1973.

Ambient air quality standards for sulfur dioxide were exceeded in the Metropolitan Philadelphia, Northwest Pennsylvania, and the Southwest Pennsylvania Air Quality Control Regions.

There are insufficient air monitoring data in the Central Pennsylvania Air Quality Control Region for sulfur dioxide. This is a Priority III region for this pollutant, and air monitors were not required during 1973.

Recent action by the State parallels the intentions of Section IV of ESECA. In an attempt to reduce the impact of fuel shortages and to conserve clean fuels, a plan revision was submitted by the State which would postpone the date of sulfur in fuel content for the City of Philadelphia until March 31, 1975. The decrease, from 0.5% to 0.3% was scheduled for October 1, 1973.

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors.

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS in the State Implementation Plan?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations.

Based on an overall evaluation of EPA's current information, AQCR's have been rated as either a good, poor or marginal candidate for revising emission limiting regulations. These ratings which are shown in Table 2-1 were determined by assessing the following criteria:

Good	Poor	Marginal
1) Adequate number of air monitoring sites	1) Violation of NAAQS	1) No air quality data or insufficient number of monitoring sites
2) No NAAQS violations	2) Attainment date for NAAQS later than 1975	2) Inconsistent "indicators"
3) Attainment date of 1975 for NAAQS in the SIP	3) Proposed AQMA	
4) No proposed AQMAs	4) Modeling results show no potential for regulation revision	
5) Modeling results show a potential for regulation revision		

For an AQCR to be rated as a good candidate, all of the criteria listed under "Good" would have to be satisfied. The overriding factor in rating an AQCR as a poor candidate is a violation of either the primary or secondary National Ambient Air Quality Standards during 1973. However, if any of the other conditions listed under "Poor" exists, the AQCR would still receive that rating. The predominant reason for a marginal rating is a lack of sufficient air quality data. In Priority III regions, air monitoring was not required during 1973, therefore, there may be no data with which to determine the current air quality status. Marginal ratings are also given when there are varying or inconsistent "indicators".

After a candidacy has been given to a region, a follow-up analysis should be conducted depending on the rating given to a region. A region

that has been indicated to be a good candidate for regulation revision should be examined in more detail by the state and the Regional office of the EPA including an examination of current air quality, emissions, and fuel use data, with which the state has more familiarity. If the state feels that clean fuels could be saved in a region rated marginal then an analysis of air quality data that may have become available since this report should be examined. If current data do not indicate a potential for regulation revision then further study would not be warranted. An AQCR that has been indicated to be a poor candidate would not warrant further study unless the state feels that new information has become available indicating that the poor rating is no longer valid.

TABLE 2-1

STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"Indicators"	Pennsylvania		Metropolitan Philadelphia AQCR 45		Northeast Penn. Upper Delaware Valley AQCR 151		Northwest Penn. Youngstown AQCR 178		Central Pennsylvania AQCR 195		South Central Pennsylvania AQCR 196		Southwest Pennsylvania AQCR 197	
	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	No	No												
• Does the State have emission limiting regulations for control of:														
1. Power plants	Yes	Yes												
2. Industrial sources	Yes	Yes												
3. Area sources	Yes	Yes												
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	Yes[a]	Yes[a]												
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	No[b]												
• Are there no proposed Air Quality Maintenance Areas?			No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[e]	Yes	No	Yes	Yes
• Is there an expected 1975 attainment date for NAAQS in the State Implementation Plan?[f]			No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?			No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?			No	No	No	No	No	No	No	No	No	No	No	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?			No	No	N.A.[c]	No	N.A.[c]	No[d]	N.A.[c]	No	N.A.[c]	No[d]	N.A.[c]	No
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Marginal	Poor	Poor

[a] Modified example region approch used for some regions.

[b] Proposed relaxation of fuel oil sulfur content in City of Philadelphia.

[c] Modeling results not available.

[d] Modeling results indicate only one power plant may use higher sulfur content coal in 1975.

[e] Priority III region not required to have air monitors until two years after final approval of SIP.

[f] Includes attainment date for either primary or secondary standard.

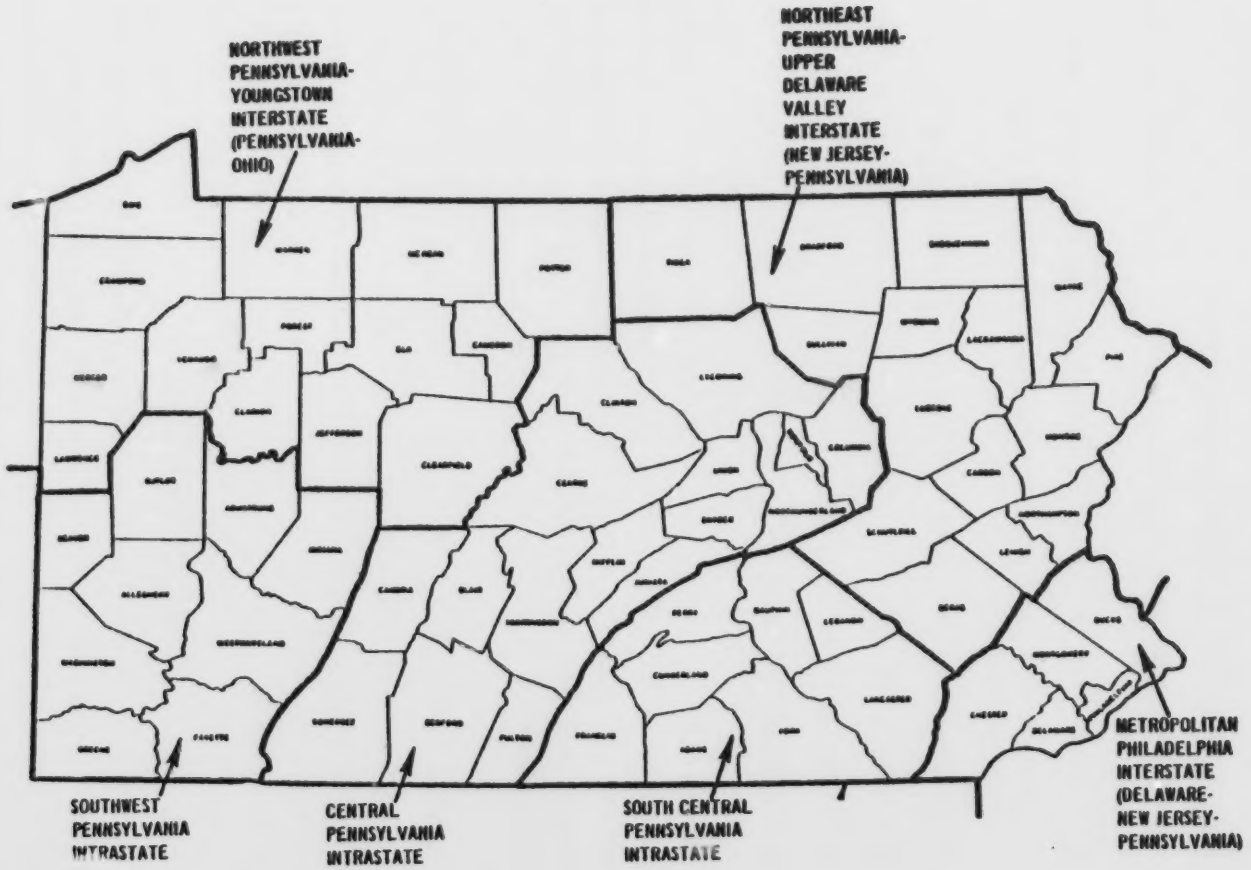
NORTHWEST PENNSYLVANIA-YOUNGSTOWN INTERSTATE (PENNSYLVANIA-OHIO)
NORTHEAST PENNSYLVANIA-UPPER DELAWARE VALLEY INTERSTATE (NEW JERSEY-PENNSYLVANIA)
METROPOLITAN PHILADELPHIA INTERSTATE (DELAWARE-NEW JERSEY-PENNSYLVANIA)
SOUTHWEST PENNSYLVANIA INTRASTATE
CENTRAL PENNSYLVANIA INTRASTATE
SOUTH CENTRAL PENNSYLVANIA INTRASTATE

Figure 2-1 PENNSYLVANIA AIR QUALITY CONTROL REGIONS

2.2 AIR QUALITY SETTING - STATE OF PENNSYLVANIA

2.2.1 Pennsylvania Air Pollution Control Areas

Pennsylvania has been divided into six Air Quality Control Regions (AQCR) as listed:

- Metropolitan Philadelphia Interstate (Delaware, New Jersey)
- Northeast Pennsylvania - Upper Delaware Valley Interstate (New Jersey)
- Northwest Pennsylvania - Youngstown Interstate (Ohio)
- Central Pennsylvania Intrastate
- South Central Pennsylvania Intrastate
- Southwest Pennsylvania Intrastate

These AQCR's are also shown in Figure 2-1 and Table A-1 in the Appendix. Also on Table A-1 are the priority classifications for total suspended particulates and sulfur dioxide, the projected 1975 population in each AQCR, and the counties that have been proposed as Air Quality Maintenance Areas.

2.2.2 Ambient Air Quality Standards

Pennsylvania has adopted the Federal ambient air quality standards for total suspended particulates and sulfur dioxide as shown on Table A-2. The state has also adopted air quality standards for sulfates which are shown on this table.

2.2.3 Pennsylvania Air Quality Status

Ambient air quality data for 1973 are summarized in Tables A-3 and A-4 for suspended particulates and sulfur dioxide respectively. These data are from the SAROAD data bank as of July 1974. It should be noted that not all of the data that have been collected by the state are necessarily in the data bank.

Total suspended particulate levels exceeded the National Ambient Air Quality Standards in each of the six Air Quality Control Regions during 1973. Significant reductions in the 1973 levels are needed in order for the regions to attain air quality standards (Table A-3). Violations of the standards were most widespread in the Southwest Pennsylvania region, where the 24-hour secondary standard was exceeded at several monitoring sites.

Sulfur dioxide levels exceeded ambient air quality standards in three Air Quality Control Regions during 1973 as shown in Table A-4. The annual standard of 80 $\mu g/m^3$ was not exceeded in the state but was equalled in the Metropolitan Philadelphia AQCR. Sulfur dioxide air quality data are not available for all of the regions. The Central Pennsylvania region is classified Priority III for SO_2 and air monitors in this region were not required during 1973. As mentioned previously, the state in most likelihood has current air quality data which were not included in the SAROAD data bank, with which to make an assessment of the air quality status with regard to sulfur dioxide.

2.2.4 Pennsylvania Emissions Summary

A summary of particulate and sulfur dioxide emissions are presented in Tables A-6 and A-7 respectively. These data are from the 1972 National Emissions Report, June 1974. There are some limitations in using these data which should be noted. The emission inventory for the major fuel combustion sources was conducted before many of the sources installed emission control equipment, and some sources that were operating at the time of the inventory are no longer in operation. A number of sources have come on-line since the inventory was completed, therefore, emissions data for these sources are not incuded in the National Emissions Data System (NEDS) and are not part of this report.

The majority of particulate emissions are from area source fuel combustion in all but one AQCR, whereas sulfur dioxide emissions are primarily from point source fuel combustion, primarily power plants.

Table A-5 shows the number of power plants in each Air Quality Control Region and the number of major fuel combustion point sources that together with the power plants contribute a significant amount of the particulate and sulfur dioxide emissions. Again this information was taken from NEDS, and it is understood that some sources may not be included in this listing. The table also shows that a majority of the emissions are from Pennsylvania fuel combustion sources; therefore, any relaxation of the regulations may have a significant impact on existing air quality.

2.3 BACKGROUND ON THE DEVELOPMENT OF PENNSYLVANIA'S CURRENT STATE IMPLEMENTATION PLAN

2.3.1 Control Strategy For Particulate Matter And Sulfur Oxides

The basis for recommending approval of the control strategies for attaining the national primary standards for particulate matter and sulfur oxides in the Pennsylvania portion of the Metropolitan Philadelphia Interstate Region was a modeling analysis prepared by EPA using the Implementation Planning Program (IPP). This analysis included (1) an extensive update of the emissions inventories that had been included in the "Existing Sulfur Oxides and Particulate Matter Plans" submitted by Pennsylvania, Delaware and New Jersey under the 1967 Clean Air Act and evaluated under the provisions of Section 16 (Savings Provision) of the Clean Air Act as amended in 1970; (2) a careful calibration of air quality data and predicted concentrations; and (3) the application of the emission limitations submitted with the final plans. This analysis supported the information presented in the plan that the primary standards for both pollutants will be attained, but that an extension is necessary to develop plans to attain the secondary standards. The emissions data, in the IPP format, and the results of the diffusion analysis are on file with EPA.

The basis for recommending approval of the primary sulfur oxides control strategy for the Southwest Pennsylvania Intrastate Region was a diffusion modeling analysis performed by Allegheny County. This modeling was found acceptable following its evaluation by IBM, under contract, and EPA's Air Quality Management Branch. This analysis used the Air Quality Display Model (AQDM) to model three "hot spots" in Allegheny County and demonstrated that the primary standards for sulfur oxides would be attained around these "hot spots," and thus the primary standards should be attained throughout the Region.

The particulate matter rollback calculations for the Southwest Pennsylvania Region indicated that the primary standards will be attained. These calculations assumed no fugitive dust from the coking process since these emissions are not allowed under Section 123.1 of Title 25. However, the plan also contains a rollback calculation which shows the effect of allowing the emissions from coking. The primary standard will be marginally attained in this case.

In the control strategy evaluation for particulate matter and sulfur oxides for the Southwest Pennsylvania Intrastate Region, it is unclear, for those areas subject to the State's control regulations, how multiple sources connected to a common flue are handled. Since both the particulate matter and sulfur oxides emission-limiting regulations have a sliding scale of allowable emissions, grouping sources connected to a common stack would allow much less emissions than computing the allowable emissions for each source and summing the total emissions. Neither the control strategy evaluation nor the State's emission-limiting regulations specify how such units are handled. However, regardless of the interpretation, the rollback demonstrations do indicate attainment of the primary standards. It also should be noted that the Allegheny County regulations which apply to the majority of the sources in the Region specify that multiple sources connected to a single stack shall be considered as one source, which is the most stringent interpretation.

The Appendix D inventory for particulate matter and sulfur oxides emissions in the Southwest Pennsylvania Intrastate Region was omitted from the final submission of the plan. This information was included in the preliminary submission, and the rollback calculation was updated for the final submission, but the detailed summary was not updated.

For the Pennsylvania portion of the Metropolitan Philadelphia Interstate Region and the Southwest Pennsylvania Intrastate Region, an 18-month extension of the deadline for submittal of the secondary sulfur oxides and particulate matter strategies has been granted. It is strongly recommended that, as part of the secondary strategies, the emission inventories should be carefully updated and correlated with validated air quality data. It is entirely possible that point sources which will be controlled were missed or included in the area sources, and thus the percent reduction realized may be greater than the reduction calculated. In any event, the secondary strategies should be developed on an updated data base to prevent the inclusion of any erroneous information which may be in the present data base.

To demonstrate attainment of the particulate matter national standards in the South Central Pennsylvania and Central Pennsylvania Intrastate Regions and the Pennsylvania portions of the Northeast Pennsylvania-Upper Delaware Valley and Northwest Pennsylvania-Youngstown Interstate Regions, a modified example region approach was used. This approach used the three contiguous State-designated air basins - Allegheny County, Monongahela Valley and Beaver Valley - and the Metropolitan Philadelphia Air Basin as the example evaluation areas. The percentage reduction in particulate matter emissions obtained in these areas was applied to the appropriate State-designated air basins located in the Federally-designated air quality control regions.

The percentage reduction in particulate matter emissions obtained in the "Composite Air Basin" (Allegheny County, Beaver Valley, and Monongahela Valley Air Basins) was applied to the Johnstown Air Basin, the Erie Air Basin the the Reading Air Basin, which have the highest particulate matter concentrations in their respective Regions. Since the Harrisburg Air Basin more closely resembles the Metropolitan Philadelphia Air Basin with regard to the ratio of point to area source emissions, the percentage reduction in particulate matter obtained in the Philadelphia Air Basin was applied to the Harrisburg Air Basin. In all cases, the predicted air quality for 1975 was at or below the secondary particulate matter standards and, thus, the strategy is recommended for approval for these Regions.

The sulfur oxides control strategy for the Pennsylvania portions of the Northeast Pennsylvania-Upper Delaware Valley and Northwest Pennsylvania-Youngstown Interstate Regions, and the Central Pennsylvania and South Central Pennsylvania Intrastate Regions was also based on a modified example region concept. The Reading Air Basin served as the example region for the air basins in these Regions, and the Southwest Pennsylvania Intrastate Region minus the "composite Air Basin" served as the example region for the non-air basin areas. The Reading Air Basin will attain the secondary sulfur oxides standards and, thus, all the air basins which have better air quality should attain the national standards. The Southwest Pennsylvania Intrastate Region, minus the "Composite Air Basin," achieved a 19 percent reduction in emissions, and therefore, even the non-urban areas should achieve an improvement in air quality. Therefore, the strategy to attain the secondary sulfur oxides standards in these Regions is recommended for approval.

In all areas where the air quality is presently below the secondary standards, the plan provides for maintaining the secondary standards. This will be accomplished by: (1) enforcement of state and/or Federal new source performance standards; (2) Pennsylvania's control of construction and modifications of sources; and (3) the provisions of Section 141.1 of Title 25, which allows the Department of Environmental Resources to impose more stringent standards for any source or class of sources, if such action is necessary to maintain a national standard.

2.4 CURRENT STATUS OF PENNSYLVANIA'S STATE IMPLEMENTATION PLAN

On April 15, 1974, the Commonwealth of Pennsylvania submitted to the Regional Administrator a proposed amendment to the City of Philadelphia portion of the approved Pennsylvania Implementation Plan for the attainment and maintenance of national ambient air quality standards.

The proposed amendment to the Pennsylvania Implementation Plan was publicly advertised and a hearing was held on September 5, 1973 in accordance with the Requirements for Preparation, Adoption and Submittal of State Implementation Plans.

The major provision of the proposal would postpone until March 31, 1975, a decrease in sulfur in fuel oils limits from 0.5 percent to 0.3 percent. This decrease had been scheduled for October 1, 1973. There is also a provision for allowing non-commercial fuel users to average stack emissions throughout a facility if it can be shown that air quality will not be adversely affected.

3.0 CURRENT ASSESSMENTS BASED ON STATE IMPLEMENTATION PLAN REVIEW

The purpose of this section is to evaluate the available information for the State of Pennsylvania and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR, addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The assessments must be made for each pollutant separately and are made on the basis of seven criteria: (1) 1973 air quality violations; (2) expected NAAQS attainment dates; (3) proposed Air Quality Maintenance Area (AQMA) designations; (4) total emissions; (5) portion of emissions from Pennsylvania fuel combustion sources; (6) regional tolerance for emissions increase; and (7) pollutant priority classifications. Tables B-1 and B-2 tabulate these criteria for each AQCR for TSP and SO_2, respectively.

As mentioned previously, regional air quality data for 1973 are presented in Tables A-3 and A-4 for total suspended particulates and sulfur dioxide respectively.

Table C-1 shows the 1973 fuel use and sulfur content of the fuel for each power plant. The sulfur content is an average content for the year, as variations of up to 20% are common. This information is from the Federal Power Commission and was used in place of the NEDS data since it is more current. Also shown in this table is the projected fuel use for 1975 for each plant, and the sulfur content of the fuel as required by the State Implementation Plan. Allowable sulfur content determined by modeling results are also shown.[1] There are limitations to be considered in using modeling results, because often assumptions are made in the input to the model, when actual data are not available. Modeling results

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[1]The modeling analysis of the power plants was performed by the Walden Research Division of Abcor, Inc. A single-source and valley model, developed by the Meteorology Laboratory, EPA, was used. The model employs a Gaussian plume model and Briggs plume rise equation. Comments on the use of the model are included in Appendix C.

are presented here as another indicator in assessing the candidacy of a region to revise emission regulations.

Appendix D shows the major industrial fuel combustion sources which were significant emitters of particulates and sulfur dioxide when the emissions inventory was conducted.

3.1 AIR QUALITY CONTROL REGION #45, METROPOLITAN PHILADELPHIA (DELAWARE, NEW JERSEY)

3.1.1 Regional Assessment

This AQCR exceeded both the annual and 24-hour secondary standards for total suspended particulates during 1973. The maximum annual average of 87 $\mu g/m^3$ and the second highest 24-hour average of 387 $\mu g/m^3$ were recorded in Philadelphia, while the highest 24-hour average was recorded in the Delaware portion of the AQCR. Thirteen of the monitoring stations were in violation of the 24-hour secondary standard, (Table A-3), and a significant reduction in the 1973 ambient levels is required for this region to meet National Ambient Air Quality Standards for particulates. This region is classified Priority I for particulate and has five counties that have been proposed as Air Quality Maintenance Areas. An 18-month extension has been granted for the attainment of the secondary standard. There is virtually no potential in this region for relaxing particulate emission limits.

Sulfur dioxide levels are slightly exceeding standards in this AQCR which is classified Priority I for this pollutant. There are also five counties proposed as AQMA's. The highest annual average recorded was 80 $\mu g/m^3$ which occurred in the New Jersey portion of the AQCR, while the highest 24-hour average in 1973 of 416 $\mu g/m^3$ occurred in Pennsylvania (Table A-4). An 18-month extension has been granted for the attainment of the standard for SO_2. There is little potential for relaxing SO_2 emission limits in this region.

3.1.2 Power Plant Assessment

There are eight power plants in the Pennsylvania portion of this Air Quality Control Region. These plants contributed 9,000 tons (1%) of the particulate emission, and 207,000 tons (38%) of the sulfur dioxide emissions. During 1973 two plants, Cromby and Eddystone, burned both coal and oil, while the remainder burned only oil (Table C-1). The fuel oil used by these plants had an average sulfur content of less than 0.5%. Since total suspended particulate levels were exceeded in this region it is unlikely that these plants could switch to coal without adversely affecting existing air quality. Switching to a higher sulfur content of fuel is also unlikely since sulfur dioxide levels also exceeded standards.

3.1.3 Industrial, Commercial, Institutional Source Assessment

Besides power plants, there are three major sources of particulate matter emissions, and five major sources of sulfur dioxide emissions in the Pennsylvania portion of this Air Quality Control Region which are listed in Table D-1. Point source fuel combustion from Pennsylvania accounts for 117,000 tons per year (12%) of particulate emissions, and 126,000 tons per year (23%) of sulfur dioxide emissions within the state. Since air quality standards are exceeded in this region for both pollutants, there is little potential for clean fuel savings from either a switch from oil to coal, or from a low sulfur to high sulfur content fuel.

3.1.4 Area Source Assessment

Area source fuel use is shown in Table E-1. Fuel combustion from area sources accounts for 184,000 tons per year (19%) of particulate emissions, and 174,000 tons per year (32%) of sulfur dioxide emission in the state. It is assumed that large-scale conversions from gas or oil to coal is impractical for most small residential, commercial, institutional and industrial facilities. A switch to a higher sulfur content coal may adversely affect existing SO_2 levels.

3.1.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

3.2 AIR QUALITY CONTROL REGION #151, NORTHEAST PENNSYLVANIA - UPPER DELAWARE VALLEY (NEW JERSEY)

3.2.1 Regional Assessment

This Air Quality Control Region has a Priority I classification for total suspended particulates and has five counties proposed as Air Quality Maintenance Areas for this pollutant. Ambient levels of suspended particulates exceeded both the annual and 24-hour secondary standards during 1973. Of the 32 monitoring stations in this region, 3 stations exceeded the annual secondary standard, and 7 stations exceeded the 24-hour secondary standard. A significant reduction in the 1973 levels is needed to achieve National Ambient Air Quality Standards in this region, and is rated a poor candidate for revising particulate emission limits.

Ambient air levels of sulfur dioxide did not exceed either the annual or the 24-hour standard in this AQCR during 1973 which is classified Priority II for this pollutant and has no proposed AQMA designations for SO_2. The highest annual arithmetic average in this region was 30 $\mu g/m^3$, while the maximum 24-hour average was 223 $\mu g/m^3$, both well below the standards. This region has a tolerance for an increase in ambient levels while still maintaining National Ambient Air Quality Standards based on 1973 data.

3.2.2 Power Plant Assessment

Electricity generation contributed 14,000 tons per year (6%) of the particulate emissions, and 156,000 tons per year (57%) of the sulfur dioxide emissions in the Pennsylvania portion of this AQCR. There are four power plants operating in this region, with the largest, the

Portland plant, burning both coal and oil during 1973. The fuel sulfur content during 1973 shows a tolerance for an increase in the content while still meeting the SIP requirements. However, more recent data supplied by the EPA Region III office shows that in January and February 1974, the average sulfur content increased over that required by the SIP at all but one plant.

3.2.3 Industrial, Commercial, Institutional Source Assessment

Besides power plants, there are two major sources of particulate emissions and one source of sulfur dioxide emissions in the Pennsylvania portion of the AQCR, which are listed in Table D-1. Point source fuel combustion contributes 8,000 tons (4%) of particulate emissions and 17,000 tons (6%) of SO_2 emissions in Pennsylvania. Current fuel use for these sources is not known.

3.2.4 Area Source Assessment

Area source fuel combustion contributes 106,000 tons per year (48%) of particulate emissions, and 10,000 tons per year (34%) of sulfur dioxide emissions in the Pennsylvania Portion of the Air Quality Control Region. Area source fuel use is shown in Table E-1. Fuel switching from oil or gas to coal is unlikely because of existing levels of particulate matter, and also because small residential, commercial and industrial sources usually do not have the particulate emission controls necessary for the amount of reduction needed in this region.

3.2.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

3.3 AIR QUALITY CONTROL REGION #178, NORTHWEST PENNSYLVANIA - YOUNGSTOWN (OHIO)

3.3.1 Regional Assessment

Ambient levels of total suspended particulates exceeded both the annual and 24-hour secondary standards in this AQCR during 1973. This region is classified Priority I for suspended particulates, and has two counties proposed as Air Quality Maintenance areas. The maximum annual average in this region was 92 $\mu g/m^3$, and was recorded in Erie County. The highest 24-hour average of 695 $\mu g/m^3$ and second highest 24-hour average of 561 $\mu g/m^3$ were both recorded in Lawrence County. Five of the ten monitoring stations in this region violated the 24-hour secondary standard. A significant reduction in the 1973 levels is required for this region to achieve National Ambient Air Quality Standards for particulates and is rated a poor candidate for revision of particulate emission limits.

Sulfur dioxide air monitoring data are somewhat spurious in this region. There are four 24-hour bubblers, only one of which is in Pennsylvania, and it was the only one that had sufficient data to calculate an annual arithmetic average. The highest 24-hour reading of 378 $\mu g/m^3$ was recorded in the Ohio portion of the AQCR and this value was used to determine the amount of reduction that is needed in the 1973 levels in order to attain air quality standards. This AQCR has a Priority II classification for sulfur dioxide, and has one county that has been proposed as an Air Quality Maintenance Area. This region should be examined in more detail with respect to air monitoring data for sulfur dioxide.

3.3.2 Power Plant Assessment

Electric power generation contributes 14,000 tons per year (11%) of the particulate emissions, and 173,000 tons per year (58%) of the sulfur dioxide emissions in the Pennsylvania portion of the Air Quality Control Region. Table C-1 lists the four power plants that are projected to be operating in this region in 1975 and their estimated fuel use.

All of the plants are presently buring coal, and are projecting coal use in 1975. The average sulfur content of the fuel used by these plants during 1973 indicates that two of the plants have a tolerance for an increase in fuel sulfur content and still meet SIP requirements, while the other two plants must decrease the sulfur content. The most significant reduction is required at the New Castle plant in Lawrence County which during 1973 burned 3.26% sulfur coal and must reduce this to 0.32% in 1975. Modeling results indicate a reduction to 0.39% is needed.

As more air quality data for sulfur dioxide become available for this region, a better assessment of the air quality may be made, and a revision to the existing regulations should not be considered until such time.

3.3.3 Industrial, Commercial, Institutional Source Assessment

There are a number of point sources in the Pennsylvania portion of this AQCR contributing a significant amount of particulate and sulfur dioxide emissions which are listed in Table D-1. Of the total emissions in the State, point sources contribute 21,000 tons per year (16%) of the particulate emissions, and 68,000 tons per year (23%) of the sulfur dioxide emissions. As with power plants, there is little potential for revising emission limits for these sources unless there is a more extensive study of existing air quality levels for sulfur dioxide, indicating that regulations may be relaxed.

3.3.4 Area Source Assessment

Area source fuel combustion accounts for 52,000 tons per year (39%) of particulate emissions, and 49,000 tons per year (17%) of sulfur dioxide emissions in the Pennsylvania portion of the AQCR. Fuel use by area sources is shown in Table E-1. Because suspended particulate levels may be exceeded, there is little potential for present facilities using gas or oil to switch to coal.

3.3.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

3.4 AIR QUALITY CONTROL REGION #195, CENTRAL PENNSYLVANIA

3.4.1 Regional Assessment

This AQCR is classified Priority I for total suspended particulates and has one county that has been proposed as an Air Quality Maintenance Area. Ambient levels of suspended particulates exceeded both the annual and 24-hour secondary standards during 1973. The maximum annual geometric mean was 107 $\mu g/m^3$, and the maximum 24-hour average was 411 $\mu g/m^3$. The annual standard was exceeded at two of the nine monitoring stations, while the 24-hour secondary standard was exceeded at three of the stations. A significant reduction of the 1973 levels is required to bring this region into compliance with the standards, and is rated as a poor candidate for revising particulate emission limits.

Sulfur dioxide levels are difficult to assess in this region because there is only one monitoring station and it had only three valid values in 1973. The highest 24-hour average in this region was 41 $\mu g/m^3$ and the second highest was 11 $\mu g/m^3$. There are no proposed AQMA designations in this region, which has a Priority III classification for SO_2. Until more air quality data are available for this region, consideration should not be given to relaxing the SO_2 emission limits. It should be noted that in Priority III regions, air monitoring was not required during 1973.

3.4.2 Power Plant Assessment

Electric power generation contributes 90,000 tons per year (44%) of the particulate emissions, and 167,000 tons per year (67%) of the sulfur dioxide emissions in this region. Table C-1 lists the four power plants that are projected to be operating in this region in 1975, and their estimated fuel use. During 1973, these plants burned coal with a sulfur content lower than that required by the SIP, although the difference is slight. Modeling results are generally in agreement with

the SIP requirements except for the Saxton plant in Bedford County. The SIP requires 2.35% sulfur coal in 1975 whereas modeling results indicate that only 1.89% will be allowable. In assessing the power plants in this region, it should be noted that except for the Sunbury plant, these plants are small and have a fairly low-projected fuel use in 1975. For instance, the Saxton plant will only burn 66,000 tons of coal; therefore if more recent air quality data indicate that sulfur dioxide emission limits may be relaxed, there will only be a minimal amount of clean fuel savings derived by the three plants.

3.4.3 Industrial, Commercial, Institutional Source Assessment

Point source fuel combustion contributes a small percentage of the particulate and sulfur dioxide emissions in this AQCR. Approximately 16,000 tons per year (8%) of the particulate emissions, and 28,000 tons per year (11%) of the sulfur dioxide emissions are from these sources. The major fuel combustion point sources are listed in Table D-1. All of the major point sources in this region used coal, therefore, none could benefit if a change in the emission regulations allowed a fuel switch. These sources could achieve a clean fuel savings by switching to a higher sulfur content coal if air quality data indicate that sulfur dioxide levels within the region could be maintained within standards.

3.4.4 Area-Source Assessment

Area source fuel combustion accounts for 50,000 tons per year (25%) of particulate emissions, and 65,000 tons per year (12%) of sulfur dioxide emissions in this region. Area source fuel use is shown in Table E-1. There is a considerable amount of oil and natural gas used in this region; however, there is little potential for these sources to switch to coal because of suspended particulate levels. Also it is usually impractical for small sources to switch fuels because of the cost involved. If SO_2 emission limits were to be relaxed, fuel savings

could be achieved by switching to higher sulfur coal and oil. The present sulfur content of the fuels used in this region is not known.

3.4.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

3.5 AIR QUALITY CONTROL REGION #196, SOUTH CENTRAL PENNSYLVANIA

3.5.1 Regional Assessment

This region is classified Priority I for suspended particulates, and has four counties proposed as Air Quality Maintenance Areas. Ambient air levels of suspended particulates exceeded both the annual geometric mean and 24-hour secondary standards during 1973. The annual standard was exceeded at two of the monitoring stations, while the 24-hour standard was exceeded at seven of the monitoring sites. The highest annual geometric mean in the region was 88 $\mu g/m^3$, while the highest and second highest 24-hour readings were 366 $\mu g/m^3$, and 243 $\mu g/m^3$ respectively (Table A-3). There is virtually no potential in this region for relaxing particulate emission limits, without adversely affecting existing air quality.

Sulfur dioxide monitoring data is not very comprehensive in this AQCR. There are three 24-hour bubbler stations in the region, however, neither had sufficient data to determine an annual average. A maximum of twenty valid values were collected at one of the stations, thirteen valid values at another station, and only one valid value at the third station. The highest 24-hour reading was 93 $\mu g/m^3$, and the second highest was 61 $\mu g/m^3$. This region is classified Priority II for sulfur dioxide and has no proposed AQMA designations for this pollutant. As with the previous AQCR that was discussed, more extensive air monitoring data should be available before relaxation of SO_2 emission regulations is considered.

3.5.2 Power Plant Assessment

Electricity generation accounts for 21,000 tons per year (20%) of the particulate emissions, and 416,000 tons per year (74%) of sulfur dioxide emissions in this region. Table C-1 lists the three power plants that are projected to be operating in this region in 1975, and their estimated fuel use. All of these plants will be burning coal, although in 1973, one of these burned coal and oil. Modeling results indicate that two of these plants may use a higher sulfur content of coal than that used during 1973. The Holtwood plant in Lancaster County is the exception. This plant, which is the smallest in the region, used 1.23% sulfur coal in 1973. The SIP requires 0.97% sulfur and modeling results indicate that 0.7% sulfur coal will be needed to maintain air quality standards in the vicinity of this plant. There is a potential in this AQCR for clean fuel savings, although slight, if further air monitoring data indicate that SO_2 emission limits may be revised.

3.5.3 Industrial, Commercial, Institutional Source Assessment

Point source fuel combustion from sources other than power plants contributes a small percentage of the emissions in this region. Approximately 16,000 tons per year (8%) of the particulate emissions, and 23,000 tons per year (4%) of the SO_2 emissions are from these sources. Table D-1 lists the major sources of these pollutants in this region.

3.5.4 Area Source Assessment

Area Source fuel combustion contributes 58,000 tons per year (43%) of the particulate emissions, and 65,000 tons per year (12%) of the sulfur dioxide emissions in this region. Area source fuel use is shown in Table E-1. As in the other regions, a switch from either gas or oil to coal is unlikely because of existing ambient air levels of particulate matter. An increase in the sulfur content of the fuels used may be possible if more air quality data for sulfur dioxide became available indicating that SO_2 emission limits may be relaxed.

3.5.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

3.6 AIR QUALITY CONTROL REGION #197, SOUTHWEST PENNSYLVANIA

3.6.1 Regional Assessment

Ambient air levels of suspended particulate matter exceeded both the annual and 24-hour secondary standard during 1973. This region has a Priority I classification for total suspended particulates and has five counties that have been proposed as Air Quality Maintenance Areas. The highest annual geometric mean in this AQCR was 101 $\mu g/m^3$ while the highest and second highest 24-hour averages recorded were 621 $\mu g/m^3$ and 443 $\mu g/m^3$ respectively. The annual standard was exceeded at only one of the 34 monitoring stations in the region; however, the 24-hour secondary standard was exceeded at 24 stations (Table A-3). A significant reduction in the 1973 levels is required for this region to achieve National Ambient Air Quality Standards. An 18-month extension has been granted for attainment of the secondary standard for suspended particulates.

This region is classified Priority I for sulfur dioxide also, and again there are five counties with proposed AQMA designations. Ambient levels of SO_2 exceeded the 24-hour standard; however, there were insufficient air monitoring data to determine an annual arithmetic average. There are three 24-hour bubbler stations and seven continuous monitoring stations in this region, and the highest 24-hour reading of 965 $\mu g/m^3$ was recorded by continuous monitoring.

There is virtually no potential in this region for relaxing either the particulate or sulfur dioxide emission limits in light of the 1973 air quality.

3.6.2 Power Plant Assessment

The generation of electricity accounts for 93,000 tons (30%) of the particulate emissions, and 950,000 tons (74%) of the sulfur dioxide emissions in this region. Table C-1 lists the power plants that are

projected to be operating in the region in 1975 and their estimated fuel use. There are modeling data available for most of these plants, and they show good agreement with the SIP requirements for the allowable sulfur content of the fuels used. Many of the plants will require a significant reduction in the coal sulfur content in order to meet the SIP requirements. The Cheswick plant in Allegheny County burned 2.03% sulfur coal in 1973 and will be required to reduce this to 0.33 by 1975. The Elrama plant in Washington County burned 2.7% sulfur coal in 1973; however, modeling results indicate that 0.6% sulfur will be required, while the SIP allows only 0.3%. Similar reductions are required at the Phillips and Springdale plants in Allegheny County, the Homer City and Seward plants in Indiana County, the Keystone plant in Armstrong County, and the Mitchell plant in Washington County. Several plants may increase the sulfur content according to modeling results and in some cases by SIP requirements also. The Conemaugh plant in Indiana County which is the largest plant in the region burned 2.23% sulfur coal in 1973, and is allowed 2.28% by the SIP and 2.39% by modeling results. The Hatfield plant in Green County, another large plant, burned 2.49% sulfur coal in 1973, which is what is required under the SIP; however, modeling results indicate that 3.0% is allowable and still maintain ambient air quality standards in the vicinity of the plant.

3.6.3 Industrial, Commercial, Institutional Source Assessment

Point source fuel combustion other than power plants contributed 36,000 tons per year (12%) of the particulate emissions, and 115,000 tons per year (9%) of the sulfur dioxide emissions in this region. Table D-1 lists the major sources of these pollutants. All of these sources are burning coal, in most cases of a high sulfur content. There is a considerable amount of oil and natural gas used by industrial point sources, as shown in Appendix F.

3.6.4 Area Source Assessment

Area source fuel combustion accounts for 129,000 tons per year (42%) of the particulate emission and 125,000 tons per year (10%) of the sulfur dioxide emission in this region. A considerable amount of natural gas is used by area sources (Appendix F); however, there is little potential for switching to coal by these sources because of suspended particulate levels. In most cases it is impractical for residential sources to switch fuels, because of the costs involved.

3.6.5 Fuel Use Assessment

Fuel use data by source are shown in Appendix F.

APPENDIX A STATE IMPLEMENTATION PLAN BACKGROUND

TABLE A-1. Pennsylvania Air Pollution Control Areas

Air Quality Control Region	Federal Number	Priority Classification[a]			Population 1975 (Millions)	Proposed AQMA Designations[b]	
		Particulates	SO_x	NO_x		TSP Counties	SO_x Counties
Metropolitan Phil. (Dela. N.J.)	45	I	I	III	6.07	Bucks, Chester, Delaware, Montgomery, Philadelphia	Bucks, Chester, Delaware, Montgomery, Philadelphia
Northeast Penn.-Upper Delaware Valley (N.J.)	151	I	II	III	2.09	Lehigh, Northampton, Berks, Lackawanna, Luzerne	
Northwest Penn.-Youngstown, Ohio	178	I	II	III	1.68	Erie, Lawrence	Lawrence
Central Penn.	195	I	III	III	1.09	Cambria	
South Central Penn.	196	I	II	III	1.35	Cumberland, Dauphin, Lancaster, York	
Southwest Penn.	197	I	I	III	2.99	Allegheny, Beaver, Fayette Washington, Westmoreland	Allegheny, Beaver, Fayette, Washington, Westmoreland

[a]Criteria Based on Maximum Measured (or Estimated) Pollution Concentration in Area

Priority	I	II	III
	Greater than ($\mu g/m^3$)	From - To ($\mu g/m^3$)	Less than ($\mu g/m^3$)
Sulfur oxide:			
Annual arithmetic mean	100	60 - 100	60
24-hour maximum	455	260 - 455	260
Particulate matter:			
Annual Geometric mean	95	60 - 95	60
24-hour maximum	325	150 - 325	150

[b]Federal Register, August, 1974, SMSA's showing potential for NAAQS violations due to growth.

TABLE A-2

AMBIENT AIR QUALITY STANDARDS (ug/m^3)

PENNSYLVANIA

		Total Suspended Particulate		Sulfur Oxides			Sulfates (As H_2SO_4)	
		Annual	24-Hour	Annual	24-Hour	3-Hour	30 Days	24-Hrs
Federal	Primary	75(G)	260[a]	80(A)	365[a]	----	---	---
	Secondary	60(G)	150[a]	---	--	1300[a]	---	---
State Jan. 27, 1972	Primary	75(G)	260[a]	80(A)	365[a]		10	30
	Secondary	60(G)	150[a]	---	--	1300[a]	---	---

(G) Geometric Mean

(A) Arithmetic Mean

[a] not to be exceeded more than once per year

TABLE A-3

PENNSYLVANIA AIR QUALITY STATUS, TSP[a]

Air Quality Control Region		No. Stations Reporting	TSP Concentration ($\mu gm/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	Number of Stations Exceeding Ambient Air Quality Standards: Primary Annual	Primary 24-Hr[c]	Secondary Annual	Secondary %	Secondary 24-Hr[c]	Secondary %	% Reduction Required to Meet Standards[d]
Metropolitan Phil.	45[b]	60	87	558	387	1	3	2	3	13	22	+ 67
Northeast Penn.	151[b]	32	107	274	219	3	1	3	9	7	22	+ 38
Northwest Penn.	178[b]	10	92	695	561	1	2	1	10	5	50	+ 78
Central Penn.	195	9	107	411	322	2	1	2	22	3	33	+ 65
South Central Penn.	196	22	88	366	243	1	0	2	9	7	32	+ 53
Southwest Penn.	197	34	214	621	455	1	8	1	3	24	71	+ 86

[a] 1973 air quality in National Air Data Bank, July 28, 1974

[b] Interstate

[c] Violations based on more than one reading in excess of standard

[d] Formula:

$$\left(\frac{\text{2nd Highest 24 Hr - 24 Hr Secondary Standard}}{\text{2nd Highest 24-Hr - Background}}\right) \times 100, \quad \left(\frac{\text{Annual - Annual Secondary Standard}}{\text{Annual - Background}}\right) \times 100$$

Background Levels: 44.5 $\mu g/m^3$ in Metropolitan Philadelphia AQCR, 35 $\mu g/m^3$ in all other AQCR's

TABLE A-4

PENNSYLVANIA AIR QUALITY STATUS SO_x[a]

Air Quality Control Region		No. Stations 24 Hr	Reporting Cont.	SO_2 Concentration (ugm/m^3) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	Number of Stations Exceeding Ambient Air Quality Standards Primary Annual	Primary 24-Hr[c]	Secondary 3-Hr[c]	% Reduction Required to Meet Standards
Metropolitan Phil.	45[b]	11	23	80[d]	416[d]	416[e]	0	0	0	+ 14
Northeast Penn.	151[b]	3	1	30[f]	223[f]	119[f]	0	0	0	-167
Northwest Penn.	178[b]	4	1	18[f]	378[d]	378[e]	0	1	0	+ 4
Central Penn.	195	1	0	---	41	11	-	0	0	-3218[g]
South Central Penn.	196	3	0	---	93	61	-	0	0	-498
Southwest Penn.	197	3	7	---	965[d]	965[e]	-	2	1	+ 62

[a] 1973 air quality data in National Air Data Bank, July 28, 1974

[b] Interstate

[c] Violation based on 2nd highest reading at any station

[d] Continuous monitor

[e] Highest value used since 2nd highest value is not available for continuous monitoring data

[f] 24-hour bubbler

[g] Only 3 valid values at this station during 1973 - not considered to be indicative of required reduction

[h] Formula:

$$\left(\frac{\text{2nd Highest 24-Hr} - \text{24-Hr Standard}}{\text{2nd Highest 24-Hr}}\right) \times 100, \left(\frac{\text{Annual} - \text{Annual Standard}}{\text{Annual}}\right) \times 100$$

TABLE A-5
PENNSYLVANIA FUEL COMBUSTION SOURCE SUMMARY

Air Quality Control Region		Power Plants[a]	Other Fuel Combustion[b] Point Sources TSP	Other Fuel Combustion[b] Point Sources SO_2	Area Sources[c]	Total Emissions[d] (10^3 Tons/Year) TSP	Total Emissions[d] (10^3 Tons/Year) SO_2	% Emissions From Penn. Fuel Combustion Sources TSP	% Emissions From Penn. Fuel Combustion Sources SO_2
Metropolitan Phil.	45[e]	8	3	5	5	1050	862	30	59
Northeast Penn.	151[e]	5	2	1	15	231	307	56	89
Northwest Penn.	178[e]	4	5	4	14	321	534	27	54
Central Penn.	195	4	4	3	16	200	249	77	99
South Central Penn.	196	3	3	2	8	158	559	70	90
Southwest Penn.	197	13	8	2	9	305	1283	85	93

a - Pennsylvania power plants only

b - Pennsylvania plants, along with power plants which contribute 90% of emissions within the state

c - Pennsylvania counties

d - Total for AQCR

e - Interstate

TABLE A-6

PENNSYLVANIA EMISSIONS SUMMARY[a], TSP

Air Quality Control Region			Total (10^3 tons/yr)	%	Electricity Generation (10^3 tons/yr)	%	Point Source Fuel Combustion (10^3 tons/yr)	%	Area Source Fuel Combustion (10^3 tons/yr)	%
Metropolitan Phil.	45	Penn.	977	43	9	1	117	12	184	19
		Other	73	4	4	5	3	4	12	16
		Total	1050	47	13	1	120	11	196	19
Northeast Penn.	151	Penn.	221	10	14	6	8	4	106	48
		Other	10	0	3	3	0	0	4	40
		Total	231	10	17	7	8	3	110	47
Northwest Penn.	178	Penn.	132	6	14	11	21	16	52	39
		Other	189	8	11	6	60	32	36	19
		Total	321	14	25	8	81	25	88	27
Central Penn.	195		203	9	90	44	16	8	50	25
South Central Penn.	196		158	7	31	20	12	8	68	43
Southwest Penn.	197		305	13	93	30	36	12	129	42
	Total		2268	100	269	12	273	12	641	28

[a] Emissions in 1972 National Emissions Report, EPA, June 1974

TABLE A-7

PENNSYLVANIA EMISSIONS SUMMARY,[a] SO_2

Air Quality Control Region			Total (10^3 tons/yr)	%	Electricity Generation (10^3 tons/yr)	%	Point Source Fuel Combustion (10^3 tons/yr)	%	Area Source Fuel Combustion (10^3 tons/yr)	%
Metropolitan Phil.	45	Penn	548	14	207	38	126	23	174	32
		Other	314	8	124	39	15	5	19	6
		Total	862	22	331	38	141	16	193	22
Northeast Penn.	151	Penn	292	8	156	53	17	6	100	34
		Other	15	0	11	73	1	7	2	13
		Total	307	8	167	54	18	6	102	33
Northwest Penn.	178	Penn	296	8	173	58	68	23	49	17
		Other	238	6	110	46	87	37	26	11
		Total	534	14	283	53	155	29	75	14
Central Penn.	195		249	7	167	67	28	11	52	21
South Central Penn.	196		559	15	416	74	23	4	65	12
Southwest Penn.	197		1283	34	950	74	115	9	125	10
		Total	3794	100	2314	61	480	13	622	16

[a]Emissions in 1972 National Emissions Report, EPA, June 1974

TABLE A-8

PENNSYLVANIA AQCR REQUIRED EMISSION REDUCTION[a]

Air Quality Control Region		Required Particulate Emission Reduction		Required SO_2 Emission Reduction	
		%	10^3 tons/year	%	10^3 tons/year
Metropolitan Phil.	45[b]	+67	+704	+14	+121
Northeast Penn.	151[b]	+38	+188	-167	-513
Northwest Penn.	178[b]	+78	+250	+ 4	+ 21
Central Penn.	195	+65	+132	---	---
South Central Penn.	196	+53	+ 84	-498	-2783
Southwest Penn.	197	+86	+262	+ 62	+795

[a] Based on a proportional change of emissions to air quality (1973)

[b] Interstate

TABLE A-9 SUMMARY OF PENNSYLVANIA EMISSION REGULATIONS FROM FUEL COMBUSTION

I. PARTICULATE MATTER EMISSIONS

A. State Regulations

1) 0.4 lbs/million BTU heat input when 50 > heat input > 2.5

2) $3.6\ E^{-0.56}$

E = heat input (10^6 BTU's/hr) when 600 > E $\geq$ 50

3) 0.1 lbs/million BTU heat input when heat input $\geq$ 600

B) City of Philadelphia

1) Units constructed or installed prior to adoption of regulations: Emissions not to exceed 0.2 lb/1000 lbs of stack gas

2) Units constructed or installed after adoption of regulations: Emissions not to exceed 0.1 lb/1000 lbs of stack gas

Above rates to be calculated by adjustment to 12% CO_2 by volume

C) Allegheny County

1) 0.4 lbs/million BTU heat input when 50 > heat input > 0.2

2) $3.6\ E^{-0.56}$

E = heat input (10^6 BTU's/Hr) when 850 > E $\geq$ 50

3) 0.08 lbs/million BTU heat input when heat input $\geq$ 850

II. SULFUR OXIDES

A) State Regulations (excluding air basins in Section B below)

1) 3 lbs/million BTU heat input when 50 > heat input > 2.5

2) $5.1\ E^{-0.14}$

E = heat input (10^6 BTU/Hr) when 2,000 > heat input > 50

3) 1.8 lbs/million BTU heat input when heat input $\geq$ 2000

B) State Regulations Applying to Allegheny County, Beaver Valley, Monongahela Valley and The Southeast Pennsylvania Air Basins

1) 1 lb/million BTU heat input when 50 > heat input > 2.5

2) $1.7\ E^{-0.14}$

E = heat input (10^6 BTU/Hr) when 2,000 > heat input > 50

3) 0.6 lb/million BTU heat input when heat input $\geq$ 2,000

C) City of Philadelphia

1) Sulfur content of commercial fuel not to exceed the following percentages by weight.

Grades of Commercial Fuel Oil	Effective 10-1-72	Effective 10-1-73 (Proposed 3-31-75)
No. 2 and lighter	0.3%	0.2%
No. 4	0.4%	0.3%
No. 5, No. 6 and heavier	0.5%	0.3%

The provisions of (a) above shall not apply if SO_2 emissions can be controlled to the following levels:

	Permissible SO_2 Emissions (lbs SO_2/million BTU heat input)	
Grades of Commercial Fuel Oil	Effective 10-1-72	Effective 10-1-73 (proposed 10-1-75)
No. 4	0.42 lbs.	0.3 lbs.
No. 5, 6, & heavier	0.52 lbs.	0.3 lbs.

D) Allegheny County

1) 1.0 lb/million BTU heat input when 50 > heat input > 0.2

2) $1.7\ E^{-0.14}$

E = heat input (10^6 BTU/Hr) when 2,000 > heat input $\geq$ 50

3) 0.6 lb/million BTU heat input when heat input $\geq$ 2,000

E) Non-Air Basins

1) 4.0 lb/million BTU heat input

APPENDIX B

REGIONAL ASSESSMENT

TABLE B-1

CANDIDACY ASSESSMENT FOR RELAXATION OF TSP REGULATIONS

Air Quality Control Region		Air Quality # Stations	Air Quality # of Stations in Violation	Expected Attainment Date	TSP Emissions (10^3 Tons/Yr.)	% Emissions From Penn. Fuel Combustion	Emission Reduction Required For NAAQS (10^3 Tons/Yr)	TSP Priority
Metropolitan Phil.	45	60	13	7/75[a]	1050	30	+704	I
Northeast Penn.	151	32	7	7/75	231	56	+201	I
Northwest Penn.	178	10	5	7/75	321	27	+250	I
Central Penn.	195	9	3	7/75	203	77	+132	I
South Central Penn.	196	22	7	7/75	158	70	+84	I
Southwest Penn.	197	34	24	7/75[a]	305	85	+220	I

[a] 18 month extension granted for secondary standard

TABLE B-2

CANDIDACY ASSESSMENT FOR RELAXATION OF SO_2 REGULATIONS

Air Quality Control Region		Air Quality # Stations	Air Quality # of Stations in Violation	Expected Attainment Date	SO_2 Emissions (10^3 Tons/Yr.)	% Emissions From Penn. Fuel Combustion	Emission Reduction Required For NAAQS (10^3 Tons/Yr)	SO_2 Priority
Metropolitan Phil.	45	34	0	7/75[a]	862	59	+121	I
Northeast Penn.	151	4	0	7/75[b]	307	89	-513	II
Northwest Penn.	178	5	1	c	534	54	+21	II
Central Penn.	195	1	0	c	249	99	-	III
South Central Penn.	196	3	0	7/75	559	90	-2783	II
Southwest Penn.	197	10	2	7/75[a]	1283	93	+795	III

[a] 18 month extension granted for secondary standard

[b] Attainment date for secondary standard, existing levels below primary standard

[c] Existing levels below secondary standard

APPENDIX C POWER PLANT ASSESSMENT

TABLE C-1
PENNSYLVANIA POWER PLANT SUMMARY

Air Quality Control Region		Plant	1975 Capacity MW	Estimated 1975 Fuel Use Type	Quantity[a]	SIP Regulations % S	Allowable[b] % S
Metropolitan Phil.	45	Barbadoes[c]	155	Oil	1119[c]	0.4	
		Chester[c]	256	Oil	1524[c]	1.13	
		Crowby	417.5	Coal Oil	447 111	0.4	
		Eddystone	1507.1[a]	Coal	1700	0.4	
		Delaware	439.25	Oil	3032[c]		
		Richmond	476.5	Oil	3000[c]	0.32	
		Schuylkill	325.4	Oil	4772		
		Southwark	345	Oil	4656		
Northeast Penn.	151	Eyler	84	Oil	707	1.24	
		Portland	426.69	Coal	1035	2.5	2.5
		Titus	225	Coal	608	1.1	1.1
		Martins Creek	146	Coal Oil	808 8911	2.6 0.4	2.6
		Stanton	146	Coal	449[d]	1.0	
Northwest Penn.	178	Front Street	118.79	Coal	335	1.5	3.9
		Shawville	640	Coal	1704	2.6	2.6
		Warren	84.59	Coal	303	2.5	2.5
		New Castle	425.79	Coal	1014	0.4	0.4
Central Penn.	195	Saxton	40.89	Coal	66	1.9	1.9
		Williamsburg	39	Coal Oil	111[c] 12029[c]	2.3	
		Sunbury	409.77	Coal	1294	2.5	2.5
		Milesburg	46	Coal	159	2.3	2.3

TABLE C-1 (cont.)

Air Quality Control Region		Plant	1975 Capacity MW	Estimated 1975 Fuel Use Type	Quantity[a]	SIP Regulations % S	Allowable[b] % S
South Central Penn.	196	Crawford	116.69	Coal	108	1.4	1.4
		Brunner Island	1558.72	Coal	3354	2.6	2.8
		Holtwood	75	Coal	443	0.7	0.7
Southwest Penn.	197	Colfax	262.5	Coal	702[c]		
		Cheswick	565	Coal	1264	0.4	0.4
		Elrama	510	Coal	1396	0.3	0.6
		Phillips	411	Coal	1125	0.3	0.3
		Reed	180	Coal	62[c]	0.4	
				Oil	12270		
		Homer City	1320	Coal	1836	2.1	2.1
		Keystone	1684	Coal	3332	2.2	2.2
		Seward	268.19	Coal	648	2.6	2.6
		Conemaugh	2324	Coal	3773	2.4	2.4
		Armstrong	326.39	Coal	960	2.5	2.5
		Mitchell	448.69	Coal	1046	0.4	0.5
		Springdale	416	Coal	646	0.5	0.5
		Hatfield	1728	Coal	3507	2.6	3.0

a - Coal quantity is in 10^3 tons/yr, oil quantity is in 10^3 bbls/yr. Source: FPC printout and Walden modeling report.

b - Modeling results

c - FPC printout shows no fuel use for 1975. Data shown is for 1973.

d - 1970 fuel use.

ADDENDUM TO APPENDIX C

USE AND LIMITATIONS OF MODELING ANALYSIS DATA[a]

1. The data inputs for the modeling have been extracted from the appropriate FPC Form 67 and the most representative meteorological data available. However, to calculate the occurrence of the highest 24-hour concentration, assumptions as to the daily emission rate are necessary. The results of the modeling exercise provide a range of the most probable maximum concentration.

2. It should be recognized that time and data constraints are such that the model predictions are useful but not omniscient. There are no data available, in general, to "validate" the model. Therefore, all relevant data, including hard data on actual daily plant operations, should be obtained, reviewed, and evaluated. In this way, the modeling results can be used as a logical part of the entire decision-making framework, not as an arbitrary, dogmatic absolute "answer", divorced from the real situation involved. In some cases it will be necessary to adjust the model's predictions based upon more complete and detailed information on a particular plant's operations.

3. Results of these evaluations are not intended to be used in any legal actions, including both public hearing and court proceedings. The very nature of atmospheric dispersion modeling is such that results are not suitable to legally prove (or disprove) a particular modeling result. The assumptions and judgments necessarily involved in modeling tend to mitigate against proof in a legal sense.

4. The best use of the data is in negotiations with states or sources in trying to establish a rational course of action to be followed with reasonable assurance that the air quality impact will be as indicated by the model.

[a] Extracted from comments by the Monitoring and Data Analysis Division, OAQPS

APPENDIX D

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE ASSESSMENT

TABLE D-1

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE ASSESSMENT[a]

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
Metropolitan Phil.	45	Rohm & Haas	680	Coal 2% S 9% A	1,820	106,000	69,200
		Scott Paper	490	Oil 2.2% S	602	39	4,370
			290	Oil 2.4% S	324	156	2,560
		Firestone	432	Oil 1.8% S	514	87	3,060
		Westinghouse	546	Oil 2% S	438	212	2,890
		Downington Paper	275	Oil 2.4% S	331	8	2,610
		Cheney State College	28	Coal 0.65% S 14% A	11,000	1,000	36
Northeast Penn.	151	Bethlehem Steel	300	Oil 0% S	407	123	839
			36	Oil 0.6% S	410	0	846
		3 Boilers each @	100	Oil 0.6%	129	0	972
		12 Boilers each @	60	Coal 0.92% S 12.3% A	62,490	3,187	969

TABLE D-1 (cont.) Page 2

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Fuel Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
Northeast Penn. (cont.)	151	Commercial Solvents	51	Coal 0.98% S 19% A	11,900	227	222
			66	Coal 0.95% S 19% A	20,000	380	361
		2 Boilers each @	76	Oil 1.2% S	161	78	638
Northwest Penn.	178	Penntech Papers					
		5 Boilers each @	134	Coal 2.25% S 10.5% S	205,500	290	8,800
			70	Coal 2.25% S 10.5% S	21,400	58	916
		Hammermill Paper	491	Coal 3% S 12% A	147,000	1,720	8,370
			134	Coal 3% S 12.4% A	32,700	516	1,860
		Sharon Steel					
		4 Boilers each @	40	Coal 3% S 10% A	87,600	2,192	5,000
			14	Coal 3% S 11% A	13,100	361	749
		FMC Corp.					
		4 Boilers each @	172	Coal 2% S 13% A	201,600	3,340	7,640

TABLE D-1 (cont.) Page 3

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Fuel Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
Northwest Penn. (cont.)	178	Pennzoil					
		3 Boilers each @	48	Coal 5.5% S 14.2% A	37,200	159	4,110
		2 Boilers each @	45	Coal 5.5% S 14.2% A	35,600	50	3,920
		General Electric	416	Coal 4% S 13.5% A	77,600	136	5,900
			260	Same	49,900	876	3,790
			219	Same	38,800	681	2,950
			165	Same	33,300	225	2,530
			150	Same	27,700	486	2,110
		Quaker State					
		4 Boilers each @	91	Coal 1.16% S 11.2% A	124,900	5,723	2,750
			101	Same	28,500	325	633
		Koppers Co.					
		4 Boilers each @	29	Coal 4% S 13% A	16,000	1,768	1,216
Central Penn.	195	Hammermill					
		4 Boilers each @	109	Coal 1.91% S 17.7% A	259,400	1,818	9,410
			177	Same	61,100	461	2,220
			142	Same	49,000	42	1,780

TABLE D-1 (cont.) Page 4

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Fuel Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
Central Penn. (cont.)	195	Westvaco Corp.					
		2 Boilers each @	110	Coal 2% S 10% A	52,600	4,460	1,998
			285	Same	87,600	5,690	3,330
		Combined Paper	60	Coal 1.5% S 8% A	29,700	283	846
			26	Same	9,900	313	282
		National Gypsum	146	Coal 1.16% S 0.1% A	7,150	82	651
		Standard Steel					
		2 Boilers each @	15	Coal 2.5% S 13% A	10,100	654	958
South Central Penn.	196	P. H. Glatfelder	357	Coal 3.5% S 8% A	64,700	1,170	4,300
			277	Same	146,000	109	533
			257	Same	61,700	533	556
			140	Same	38,200	462	2,580
		Hershey Foods					
		5 Boilers each @	155	Coal 2.25% S 11.8% A	74,480	7,480	3,183
		Armstrong Cork	152	Coal 2.5% S 1.1% A	1,950	22	359

TABLE D-1 (cont.) Page 5

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Fuel Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
South Central Penn. (cont.)	196	Armstrong Cork	43	Oil 0.1% S	78	37	958
		Shippensburg State College	99	Coal 0.5% S 14% A	13,100	125	1,200
Southwest Penn.	197	U.S. Steel	682	Coal 4.34% S 9.5% A	228,000	368	18,800
		2 Boilers each @	481	Coal 1.62% S 6.7 % A	298,000	632	9,160
			206	Same	61,300	144	1,890
		Sinclair Koppers					
		4 Boilers each @	470	Coal 3.12% S 16.9% A	363,200	732	21,550
		Marquette Cement	300	Coal 3% S 11% A	84,000	6,010	4,790
			96	Same	12,600	901	718
		Jones & Laughlin	660	Coal 1.8% S 9.3% A	105,000	8,310	3,600
		Union Carbide	168	Coal 2.75% S 14% A	61,300	1,350	3,200
		Witco Chemical					
		2 Boilers each @	124	Coal 2.5% S 9% A	61,300	2,921	2,910

TABLE D-1 (cont.) Page 6

Air Quality Control Region		Source	Boiler Capacity 10^6 BTU/Hr	Fuel Type	Fuel Amount[b]	Emissions (Tons/Year) TSP	Emissions (Tons/Year) SO_2
Southwest Penn. (cont.)	197	Neville Chemical	44	Coal 2% S 9% A	23,300	1,360	886
		Western Electric	--	Coal 1.75% S 13.1% A	18,200	2,020	604

a - Data are taken from the NEDS Inventory. Fuel use and emissions are for 1970.

b - Fuel amounts: Coal is in Tons/Year, oil is in 10^3 BBLS/Yr.

APPENDIX E AREA SOURCE FUEL USE

TABLE E-1

AREA SOURCE FUEL USE SUMMARY[a]

AQCR	Coal(10^3 Tons)		Oil(10^3 BBLS)		Natural Gas
	Anthracite	Bituminous	Residual	Distillate	(10^6 cu. ft.)
Metropolitan Phil.					
Residential	234.8	---	--	20332	131880
Industrial	2.7	230.5	3861	637	94790
Comm/Inst.	3.5	19.5	4687	8566	37000
Total	241.0	250.0	8548	29535	263670
Northeast Penn.					
Residential	623.3	---	--	7354	24790
Industrial	---	1496.8	2086	98	44250
Comm/Inst.	---	41.4	2149	2517	20530
Total	623.3	1538.2	4235	9969	89570
Northwest Penn.					
Residential	5.3	244.1	--	1751	62620
Industrial	---	1141.5	973	199	29310
Comm/Inst.	---	97.9	1148	2059	13770
Total	5.3	1483.5	2121	4009	105700
Central Penn.					
Residential	675.1	---	--	3169	12600
Industrial	---	668.5	908	--	19510
Comm/Inst.	---	23.4	1227	1121	10090
Total	675.1	691.9	2135	4290	42200
South Central Penn.					
Residential	269.0	---	--	5957	15630
Industrial	---	953.1	1293	--	27780
Comm/Inst.	---	28.8	1502	1377	14420
Total	269.0	981.9	2795	7334	57830

TABLE E-1 (cont.)

AQCR	Coal(10^3 Tons)		Oil(10^3 BBLS)		Natural Gas (10^6 cu. ft.)
	Anthracite	Bituminous	Residual	Distillate	
Southwest Penn.					
Residential	0.8	481.2	--	1897	122500
Industrial	---	1783.0	2420	--	51980
Comm/Inst.	---	65.3	2423	3124	33150
Total	0.8	2329.5	5843	5021	207630

[a] Source: Stationary Source Fuel Summary Report, NEDS, Nov. 1974

APPENDIX F AQCR FUEL USE

TABLE F-1

FUEL USE SUMMARY[a]

Air Quality Control Region	Coal (10^3 Tons)		Oil (10^3 Barrels)		Gas (10^6 cu. ft.)	
	Anthracite	Bituminous	Residual	Distillate	Natural	Process
Metropolitan Philadelphia						
Point Sources	140.2	5369.9	58902.6	3317.3	263.7	13.1
Area Sources	241.0	250.0	8548.0	29535.0	47.4	0
Total	381.2	5619.9	67450.6	32852.3	311.1	13.1
Northeast Penn.-Upper Delaware Valley						
Point Sources	1180.3	3494.0	1740	2388	10179	58022
Area Sources	623.3	1538.2	4235	9969	89570	0
Total	1803.6	5032.2	5975	12357	99749	58022
Northwest Penn.-Youngstown						
Point Sources	72.9	6736.0	355	208	96322	207539
Area Sources	5.3	1483.5	2121	4009	105700	0
Total	78.2	8219.5	2476	4217	202022	207539
Central Penn.						
Point Sources	90.8	3042.1	207	275	9511	0
Area Sources	675.1	691.9	2135	4290	42200	0
Total	765.9	3734.0	2342	4565	51711	0
South Central Penn.						
Point Sources	628	10832	2073	534	57830	0
Area Sources	269	982	2795	7334	1544	0
Total	897	11814	4868	7868	59374	0
Southwest Penn.						
Point Sources	0	28489	703	1508	31134	51486
Area Sources	0.8	2329	5843	5021	207630	0
Total	0.8	30818	6546	6529	238764	51486

[a] Source: Stationary Source Fuel Summary Report, NEDS, Nov. 1974